

## Appendices

---

## Appendix A

---

# Appendix A

## Sources of Data Reviewed

---

This Appendix describes the many sources of data reviewed during preparation of the Consolidated Report. Limitations of the data are also presented.

The King County area includes a wide range of water systems, varying in size and type. No single source of data covers all of these systems. Therefore, multiple sources of data have been reviewed. This section describes these data sources and identifies the type of information extracted from each source.

### ❑ 2001 Central Puget Sound Regional Water Supply Outlook, Supply Data

The Central Puget Sound Regional Water Suppliers' Forum (Forum) has developed a regional analysis of water supply and demand covering King, Pierce, and Snohomish Counties. This project is known as the Central Puget Sound Regional Water Supply Outlook (Outlook). As part of that effort, utility information from individual water systems was requested in a two-part survey that was sent to 158 of the largest utilities in the three-county area. Of the 50 utilities surveyed in King County, 43 responded to the survey. Collectively, these 43 utilities serve approximately 88 percent of the population in King County. Water supply information obtained includes water rights, source capacity, and planned supply improvements.

The survey process took place in two stages during 1998 and 1999. Outlook efforts in 2000 and 2001 have verified and updated much of the information received from utilities. The result of this process has been a continual update to the supply and demand data that is used in the Outlook analysis.

For water systems in King County having more than 500 connections, the Outlook provides the most comprehensive source of water-supply data available. It is therefore used extensively in this review.

### ❑ Water System Plans

A total of 40 individual utility water system plans (WSPs) submitted to the Washington State Department of Health (DOH) were reviewed for Group A systems in order to obtain projected demands and detailed supply information. However, a majority of those WSPs were for utilities for which more recent data were available from the Outlook. Those systems not covered in the Outlook, but for whom the WSP provided the required data, are listed in Table A-1.

**Table A-1**  
**Water System Plans Reviewed for Utilities Not Covered in Outlook<sup>(1)</sup>**

|                                   |
|-----------------------------------|
| King County Water District No. 54 |
| King County Water District No. 94 |
| Gold Beach Water Company, Inc.    |
| Beaux Arts Water Department       |
| Diamond Springs Water Association |
| Ravensdale Water Supply           |
| Tiger Mountain Tracts             |

Footnote:

(1) Additional Water System Plans were reviewed to confirm information obtained by the Outlook process.

## ❑ Consolidated Report Surveys

There are some large Group A Community water systems (defined as those with greater than 200 connections for the purposes of this technical memorandum) for which neither Outlook survey data or WSPs exist. In order to obtain current information on these systems, an additional survey was created as part of the Consolidated Report effort and sent to these ten utilities. Similar in form to the Outlook surveys, these surveys were used to garner supply and demand information where it was lacking from either the Outlook process or WSPs. The utilities who received these surveys and from whom information was received are listed in Table A-2.

**Table A-2**  
**Utilities Surveyed for Consolidated Report**

|                                   |
|-----------------------------------|
| Burton Water Company, Inc.        |
| Cherokee Bay Community Club, Inc. |
| Riverbend Homeowners Association  |
| Snoqualmie Pass Utility District  |
| Westside Water Association        |

## ❑ Outlook, Demand Projections

The Outlook survey process described above also yielded information on each utility's water demands. This included both historical demands from 1990-98, and forecast demands up to 2020 where available. Water consumption data from each utility from the period 1996-98 was used as an input in a regionally-consistent demand-forecasting model. This included water-use reductions achieved through water conservation programs implemented through 1998. In addition, an estimate of demand reductions that will occur through year 2020 due to the 1993 plumbing code, which requires water-efficient plumbing fixtures in new construction and remodeling, was incorporated in these "baseline" demand forecasts. This model also relied on demographic and economic projections prepared by the Puget Sound Regional Council (PSRC).

A full description of the Outlook demand forecasting methodology can be found in the Outlook Technical Memorandum entitled “Population and Demand Forecast” and dated February 24, 2000.

For purposes of analyzing individual utilities in this review, demand forecasts provided by the utilities themselves were used if available. For those utilities that did not provide demand forecasts through the survey process, demand forecasts generated by the Outlook were used instead. Outlook forecasts were also used in projecting demands on a countywide or regional basis, because the Outlook used a methodology that is based on utility data, yet improves consistency across the entire County.

❑ Report: “Water Demand and Sources of Supply in King County”

In 1999 and early 2000, SPU staff developed a 40-page report describing the ability of utilities to provide water supply to meet expected growth within the urban growth boundary of King County through 2020. The report was developed in collaboration with the Cascade Water Alliance, the East and South King County Regional Water Associations, Water Suppliers Association, and King County Department of Natural Resources. It included data and projections from the Outlook. This report was used extensively in developing the supply and demand comparisons in of the 2001 Outlook, and the results are carried through into this report.

❑ East King County Coordinated Water System Plan

Developed originally in 1989, this document set forth a framework for water resource planning coordinated between large water utilities in East King County. The document was reviewed primarily to obtain the policies and procedures developed to address failing small systems.

❑ South King County Coordinated Water System Plan

Developed at the same time, and for the same purpose as the East King County Coordinated Water System Plan, but geared toward coordination between large utilities in South King County.

❑ Washington State Department of Health Drinking Water Automated Information Network Database

The DOH maintains an active database termed the Drinking Water Automated Information Network (DRAIN), which contains an array of information for all public water systems (both Group A and Group B systems). The majority of the data is provided by individual water systems via responses to a yearly Water Facilities Inventory (WFI) report form. Such data includes the number of connections served, a description of the source(s)

of supply, source capacity, and various water quality measurements (based on the individual requirements for each system). Additional information is added to the database by DOH in order to track compliance with regulations.

DWAIN data is used extensively throughout this report in the description of the County's water systems, the analysis of supply and demand, and review of water quality data and operating permit status.

❑ Seattle-King County Department of Public Health Database

The Seattle-King County Department of Public Health (Seattle-King County Health) maintains a database for Group B public water systems in the County with less than 10 connections. Based primarily on the WFI, the database also contains valuable information from well logs and inspections made by Seattle-King County Health. System descriptive information is quite similar to that in the WFI. Additional information, primarily composed of water quality and well performance data, is used in this memorandum for analysis of small Group B systems.

❑ DOH Geographical Information Systems (GIS) Data

DOH has compiled Geographical Information Systems (GIS) data concerning the location of all ground water wells associated with public water systems within the state. This information was obtained for systems within King County and was used in the development of exhibits containing well locations presented in association with this report. GIS data was also obtained from DOH relating to ground water wells identified as having experienced elevated levels of arsenic, based on monitoring data reported to DOH. This information was also used in developing an exhibit as part of the water quality review discussed in this report.

❑ King County GIS Data

GIS data obtained from King County includes base coverages of the County. These include the location of large public water system service areas, the location of Group A and Group B water system wells, Water Resource Inventory Areas (WRIA), and Urban Growth Area (UGA) boundaries.

❑ Interviews with DOH Staff

DOH has oversight concerning all public water systems within the State; and, the agency directly regulates Group A systems and Group B systems with ten or more connections. Various staff members, as listed in Table A-3, were interviewed to obtain data primarily on smaller systems for which more detailed information was not available from other sources. In general, agency staff had no additional information to provide concerning water

demand and source quantity other than what was obtained via other methods described above. However, valuable information was received regarding water quality concerns throughout the County, including specific information identifying areas prone to ground water under the influence of surface water (GUI), which is defined as a situation where the quality of a ground water supply is affected by intrusion of nearby surface water. Information regarding ground water wells that have experienced elevated levels of arsenic was also obtained. This data is used in the analysis of water quality related concerns.

**Table A-3**  
**Department of Health Staff Interviewed**  
**for Consolidated Report**

| <b>Name</b>      | <b>Position and/or Expertise</b>   |
|------------------|------------------------------------|
| Bob James        | Regional Engineer (King County)    |
| Carol Stuckey    | Water Quality                      |
| Ingrid Salmon    | Compliance Officer (lead & copper) |
| Stacey Patterson | Water System Planner               |
| David Jennings   | GIS Specialist                     |
| Steve Hulsman    | Water Quality                      |

☐ Interviews with King County Staff

Seattle-King County Health has direct regulatory oversight of small Group B public water systems having less than 10 connections, with the department's database being the primary source of information for these systems. To confirm the database information and obtain general water quality data, Gerald Cox (Senior Environmental Health Specialist for the Drinking Water Program) and Ken Johnson (Ground Water Program Lead for King County's Department of Natural Resources, Water and Land Resources Division) were interviewed. The primary finding from these discussions was that the database contained the most relevant information available from County staff regarding water systems.

☐ Interviews with Regional Water Association Staff and Knowledgeable Persons

There is little documented data available for small systems within the County, aside from that in the State and County databases. In an attempt to identify potential areas of concern that may not be reflected in these databases, various persons with knowledge of the County's water systems were interviewed. The list of those interviewed is provided in Table A-4, and consists of staff members of regional water associations, staff of large King County water utilities, and others. The objective of these interviews was to obtain information regarding small systems near or within the areas of their activities, in order to identify smaller systems that may be currently

experiencing, or are anticipated to have, water quantity or quality related problems.

| <b>Table A-4</b><br><b>Regional Water Association Staff, Utility Staff, and Others</b><br><b>Interviewed for Consolidated Report</b> |                      |
|--|----------------------|
| <b>Association/Utility</b>   | <b>Staff Contact</b> |
| East King County Regional Water Association  | Bob Pancoast         |
| South King County Regional Water Association   | Don Wright           |
| City of North Bend   | Phil Messina         |
| Enumclaw Water Department  | Mark Bauer           |
| Sammamish Plateau Water & Sewer  | Ron Little           |
| King County Water District No. 111   | Larry Bradbury       |
| Northshore Utility District  | Dan Olson            |
| Professional who has historically consulted many small east King County systems  | Renny Lillejord      |

❑ **Review of State Water Rights Application Tracking System (WRATS) Database**

Seattle Public Utilities (SPU) reviewed data from the Washington State Department of Ecology's Water Rights Application Tracking System (WRATS). Information regarding the nature and quantity of water rights associated with commercial and agricultural consumers is utilized in this memorandum to aid in the characterization of water systems and usage in King County.